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STATE OF WASHINGTON

DEPARTMENT OF ECOLOGY

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November 14, 1995

Mr. Bill Wedlake  
Spokane County Utilities Department  
West 1026 Broadway  
Spokane, WA 99260

Dear Mr. Wedlake:

Re: Colbert Landfill\Draft NPDES Substantive Requirements

The Washington State Department of Ecology, under the direction of Marian Abbett, has prepared draft substantive requirements for the County's treated groundwater discharge to the Little Spokane River. The draft requirements are enclosed for the County's review.

If you would like to discuss any technical or regulatory issues in the requirements, please call Ms. Abbett at (360) 407-7221. Formal communication should be directed to me. If you have any questions regarding this letter, please contact me at (360) 407-7239. We look forward to working with the you to finalize the requirements.

Sincerely,

Mike Kuntz

MK:gj  
Enclosure

cc: Marian Abbett, Ecology  
Neil Thompson, EPA



**DRAFT**

**SUBSTANTIVE DISCHARGE REQUIREMENTS**

State of Washington  
DEPARTMENT OF ECOLOGY  
Toxics Cleanup Program  
Site Cleanup Section  
P.O. Box 47600  
Olympia, Washington 98504-4600

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<u>Site Location:</u>	Spokane County Colbert Landfill
<u>Discharge Type:</u>	Remediation of Contaminated Groundwater
<u>Discharge Location:</u>	Township - 27 North Range - 43 East, W.M. Section - 3 Northwestern Quadrant
<u>Receiving Water:</u>	Little Spokane River
<u>Waterway Segment Number:</u>	245501

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## STATEMENT OF PURPOSE

In September 1987, a Record of Decision (ROD) for interim and final remedial action at the Spokane County Colbert Landfill Superfund Site was signed by the Environmental Protection Agency (EPA) and the Washington State Department of Ecology (Ecology). The Colbert Landfill ROD was developed in accordance with the Comprehensive Environmental Response, Compensation and Liability Act of 1980 (CERCLA), as amended by the Superfund Amendments and Reauthorization Act of 1986 (SARA). On March 9, 1989, Spokane County agreed to the requested remedial action by signing a Consent Decree.

The remedial action includes the management of the migration of contaminants present in the groundwater due to the Colbert Landfill. Contaminated groundwater is to be extracted and treated for volatile organic compounds by air stripping. Treated groundwater is to be discharged to the Little Spokane River. Pursuant to Section 121(e) of CERCLA, a National Pollutant Discharge Elimination System (NPDES) permit is not required for remedial activities conducted entirely on-site. However, all substantive requirements for an NPDES permit must be met.

In compliance with the provisions of the Federal Water Pollution Control Act and the State of Washington Water Pollution Control Law, Chapter 90.48 RCW, the National Pollutant Discharge Elimination System Permit Program, Chapter 173-220 WAC, and the Water Quality Standards for the Surface Waters of the State of Washington, Chapter 173-201A WAC, this document establishes discharge requirements for the treated groundwater to the Little Spokane River.

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## **FACT SHEET**

This fact sheet explains the Substantive Requirements of the NPDES regulations to be met at the Colbert Landfill Superfund site. This fact sheet also explains the nature of the proposed discharge, the limits placed on the contaminants in treated groundwater, and the regulatory and technical basis for those limits. The final limits of discharge will be based on the efficiency of the treatment system, within the performance and evaluation criteria of the Consent Decree. These requirements will be evaluated after five years from the date of issuance of this document, or sooner as appropriate.

## **BACKGROUND INFORMATION**

### **SITE HISTORY AND BACKGROUND**

The Colbert Landfill is a Spokane County owned sanitary landfill that was operated from 1968 through 1986. The landfill is located in Spokane County, approximately 15 miles north-northeast of Spokane, Washington, and covers 40 acres. During the five years from 1975 to 1980, a local electronics manufacturing company, KeyTronic Corporation, used the Colbert Landfill to dispose of spent organic solvents, mainly methylene chloride (MC) and 1,1,1-trichloroethane (TCA). During the same period, a nearby military facility, Fairchild Air Force Base, also disposed of various solvent wastes at the site. A variety of other chemicals, such as pesticides and refinery tar residues, from other sources were also disposed at the site, but have not been detected to date.

In 1980 nearby residents complained to Ecology about these disposal practices. State and county officials, under the lead of the Spokane County Utilities Department, initiated an investigation into complaints of groundwater contamination in the area by sampling nearby private wells of which some were found to be contaminated with TCA. In August of 1983, EPA, pursuant to Section 105 of CERCLA, placed the Colbert Landfill Site on the National Priorities List. A Remedial Investigation/Feasibility Study (RI/FS) was completed in 1987. The site boundary is shown on Figure 1-1.

### **WASTEWATER CHARACTERIZATION**

Groundwater at the Colbert Landfill Site is contaminated by volatile organic compounds (VOCs). These contaminants are present in the upper sand/gravel aquifer and the lower sand/gravel aquifer. The six VOCs detected at the highest concentrations are listed in Table 1. The ROD selected these VOCs as the main contaminants of concern; treatment for these contaminants should address all other VOCs present in the groundwater. These six VOCs are the indicator parameters of concern requiring effluent limits.

Table 1. Contaminants of Concern in Groundwater

Contaminants	Maximum Concentration Detected (ug/L) <sup>1</sup>	
	Upper Aquifer	Lower Aquifer
1,1,1-Trichloroethane (TCA)	1300	5600
1,1-Dichloroethylene (DCE)	47	190
1,1-Dichloroethane (DCA)	600	420
Trichloroethylene (TCE)	72	230
Tetrachloroethylene (PCE)	23	1
Methylene Chloride (MC)	ND <sup>2</sup>	2500

In addition, data collected during and following the RI/FS included analysis of groundwater samples for other potential pollutants such as semi-volatile organic compounds, pesticides, polychlorinated biphenyls (PCBs), and priority pollutant metals. These pollutant types were not detected in the groundwater above levels of concern for public health and the environment.

Barium, iron, and manganese were the only metals with published water quality criteria detected in groundwater. Barium and iron concentrations were below the water quality criteria. At least one detection of manganese exceeded the water quality criteria. Manganese has been retained as a parameter of concern requiring effluent limits. Iron has also been retained as it is commonly found in landfill leachate. Presence of iron in contaminated groundwater may be sporadic.

Samples of groundwater and surface water (receiving water) were analyzed for inorganic/conventional parameters. Chloride was detected in the receiving water at concentrations greater than published water quality criteria. Chloride has been retained as a parameter of concern requiring effluent limits. Nitrates and total phosphorous were detected in groundwater. These conventional parameters are of concern as they can stimulate excessive or nuisance growths of algae and other aquatic plants. The discharge for the Colbert Landfill project is to the Little Spokane River about 20 river miles upstream of the Spokane River, which eventually flows into Long Lake. A memorandum of agreement is in place for the Spokane River Phosphorous Management Plan to control phosphorous discharges to the Spokane River from all point source dischargers. Both nitrates and total phosphorous are retained as parameters of concern requiring effluent limits.

<sup>1</sup> ROD, September 1987

<sup>2</sup> ND = not detected

## DESCRIPTION OF TREATMENT PROCESS

The Consent Decree required the design and implementation of a groundwater extraction and treatment system for the contaminated groundwater. The treatment system became operational in the Spring of 1994.

The groundwater extraction system consists of ten extraction wells, four in the upper aquifer and six in the confined lower aquifer. The groundwater extraction system includes three components: the South Interception System, the West Interception System, and the East Extraction System. The South System intercepts groundwater to prevent further migration of the constituents of concern in the Upper Sand/Gravel Aquifer, and consists of groundwater extraction wells CP-S1, CP-S4, CP-S5 and CP-S6. The West System intercepts groundwater to prevent further spread of the constituents of concern in the Lower Sand/Gravel Aquifer, and consists of groundwater extraction wells CP-W1, CP-W2 and CP-W3. The East System provides source control, extracts groundwater from the Lower Sand/Gravel Aquifer and Basalt Aquifers, and consists of groundwater extraction wells CP-E1 and CP-E3 (Lower Sand/Gravel Aquifer) and CP-E2 (Basalt Aquifer). (See Figure 1-2).

The treatment facility receives groundwater pumped from the extraction wells through a series of interconnecting pipelines (Figure 1-2). All extracted groundwater is combined into a single pipeline after flow metering at the treatment facility. A nontoxic polyacrylate-based scale control chemical is metered into the combined groundwater pipeline on a flow proportional basis prior to discharge of the water to the air stripping tower to prevent the precipitation of mineral scale on the air stripping tower media. Extracted groundwater is conveyed to the top of the air stripping tower, distributed evenly over the horizontal cross-sectional area and then allowed to trickle down over the internal media. Air is blown through the stripping tower by an electrically driven fan, which maintains a minimum air-to-water ratio of approximately 100 (volume-to-volume basis). The volatile gases dissolved in the groundwater diffuse into the air stream as the water trickles down the tower. The air containing the constituents of concern is discharged to the atmosphere from the top of the air stripping tower, which is approximately 70 feet above the ground surface. The treated groundwater collects in the air stripping tower sump and flows out of the sump by gravity through a pipeline that conveys the treated water to the Little Spokane River. The outfall is an 18-24 inch corrugated pipe extending out from the upper bank of the river approximately 2-3 feet.

## SUMMARY OF COMPLIANCE WITH PREVIOUS SUBSTANTIVE REQUIREMENTS

A set of substantive requirements was provided to Spokane County on November 1, 1994. Based on Remedial Action Status Reports, submitted quarterly, Spokane County has remained in compliance with the previous substantive requirements

## **PROPOSED LIMITATIONS AND CONDITIONS**

Federal and State regulations require that effluent limitations set forth in a NPDES permit must be either technology- or water quality-based. Technology-based limitations are based upon the treatment methods available to treat specific wastewater. Technology-based limitations are set by regulation or developed on a case-by-case basis (40 CFR 125.3, and chapter 173-220 WAC). Water quality-based limitations are based upon compliance with the Surface Water Quality Standards (chapter 173-201A WAC), Ground Water Standards (chapter 173-200 WAC) or Sediment Quality Standards (chapter 173-204 WAC). The more stringent of these two limits must be chosen for each of the parameters of concern. Each of these types of limits is described in more detail below.

### **TECHNOLOGY-BASED EFFLUENT LIMITATIONS**

Technology-based limits for VOCs removed by air stripping have not been published. Air stripping is a proven technology for removing volatile organic compounds present in water. The treatment plant should reduce contaminant levels below water quality-based limits. Percent removal efficiencies that are demonstrated as being reasonable to achieve will be maintained, and will be used to establish technology-based effluent limits.

### **SURFACE WATER QUALITY-BASED EFFLUENT LIMITATIONS**

In order to protect existing water quality and preserve the designated beneficial uses of Washington's surface waters, WAC 173-201A-060 states that waste discharge permits shall be conditioned such that the discharge will meet established Surface Water Quality Standards. The Washington State Surface Water Quality Standards (chapter 173-201A WAC) is a state regulation designed to protect the beneficial uses of the surface waters of the state.

#### **Numerical Criteria for the Protection of Aquatic Life**

"Numerical" water quality criteria are numerical values set forth in the State of Washington's Water Quality Standards for Surface Waters (chapter 173-201A WAC). They specify the levels of pollutants allowed in a receiving water while remaining protective of aquatic life. Numerical criteria set forth in the Water Quality Standards are used along with chemical and physical data for the wastewater and receiving water to derive the effluent limits in the discharge permit. When surface water quality-based limits are more stringent or potentially more stringent than technology-based limitations, they must be used in a permit.

## Numerical Criteria for the Protection of Human Health

The U.S. EPA has promulgated 91 numeric water quality criteria for the protection of human health that are applicable to Washington State. These are published in the National Toxics Rule, Federal Register, V. 57, No. 246, Tuesday, December 22, 1992. These criteria are designed to protect humans from cancer and other disease and are primarily applicable to fish and shellfish consumption and drinking water from surface waters.

## Narrative Criteria

In addition to numerical criteria, "narrative" water quality criteria (WAC 173-201A-030) limit toxic, radioactive, or deleterious material concentrations below those which have the potential to adversely affect characteristic water uses, cause acute or chronic toxicity to biota, impair aesthetic values, or adversely affect human health. Narrative criteria protect the specific beneficial uses of all fresh (WAC 173-201A-130) and marine (WAC 173-201A-140) waters in the State of Washington.

## Antidegradation

The State of Washington's Antidegradation Policy requires that discharges into a receiving water shall not further degrade the existing water quality of the water body. In cases where the natural conditions of a receiving water are of lower quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. Similarly, when the natural conditions of a receiving water are of higher quality than the criteria assigned, the natural conditions shall constitute the water quality criteria. More information on the State Antidegradation Policy can be obtained by referring to WAC 173-201A-070.

Ecology has reviewed existing records and is unable to determine if ambient water quality is either higher or lower than the designated classification criteria given in chapter 173-201A WAC; therefore, Ecology will use the designated classification criteria for this water body in establishing substantive requirements. The discharge should not cause a degradation of existing water quality or beneficial uses.

## Critical Conditions

Surface water quality-based limits are derived for the waterbody's critical condition, which represents the receiving water and waste discharge condition with the highest potential for adverse impact on the aquatic biota, human health, and existing or characteristic water body uses.

## Mixing Zones

The Water Quality Standards allow the Department of Ecology to authorize mixing zones around a point of discharge in establishing surface water quality-based effluent limits. Both "acute" and "chronic" mixing zones may be authorized for pollutants that can have a toxic effect on the aquatic environment near the point of discharge. The concentration of pollutants at the boundary of these mixing zones may not exceed the numerical criteria for that type of zone. Mixing zones can only be authorized for discharges that are receiving all known, available, and reasonable methods of prevention and control (AKART) and in accordance with other mixing zone requirements of WAC 173-201A-100.

The National Toxics Rule allows the chronic mixing zone to be used to meet human health criteria.

## Description of the Receiving Water

The facility discharges to the Little Spokane River which is designated as a Class A receiving water in the vicinity of the outfall. Characteristic uses include the following:

water supply (domestic, industrial, agricultural); stock watering; fish migration; fish rearing, spawning and harvesting; wildlife habitat; primary contact recreation; sport fishing; boating and aesthetic enjoyment; commerce and navigation.

Water quality of this class shall meet or exceed the requirements for all or substantially all uses.

## Surface Water Quality Criteria

Applicable criteria are defined in chapter 173-201A WAC for aquatic biota. Criteria for this discharge are summarized below:

Fecal Coliforms	100 colonies/100 mL maximum geometric mean
Dissolved Oxygen	8 mg/L minimum
Temperature	18 degrees Celsius maximum
pH	6.5 to 8.5 standard units
Turbidity	less than 5 NTU above background
Toxics	No toxics in toxic amounts (see Table 2 for numeric criteria for toxics of concern for this discharge)

## Consideration of Surface Water Quality-Based Limits for Numeric Criteria

The following table presents the effluent limitations for toxics which may be present in the discharge. The basis for selection of the limits follows.

Table 2. Effluent Limitations

Parameter	Monthly Average <sup>3</sup>	Daily Maximum <sup>4,5</sup>
Chloride	230 mg/L	
DCA		4050 ug/L
DCE		1 ug/L
Iron	300 ug/L	
Manganese	50 ug/L	
MC		2.5 - 25* ug/L
Nitrates	10 mg/L	
Total Phosphorus		930 ug/L
PCE		0.7 - 7* ug/L
TCA		200 ug/L
TCE		5 ug/L

*\*These figures are part of the evaluation and performance criteria in the Consent Decree.*

Except for DCE, the effluent limits for the other five indicator VOCs are based on the remediation goals established in the Record of Decision. The effluent limits for all six VOCs are based upon human health protection levels, i.e. Safe Drinking Water Act Maximum Contaminant Levels (MCLs), water quality criteria for the protection of human health published in the National Toxics Rule (NTR), or risk-based levels. Table 3 provides a comparison of the ROD criteria to numerical criteria for the protection of human health which includes fish consumption, and to the Practical Quantitation Limits (PQL) for EPA Method 8010.

Table 3. ROD Criteria vs. NTR values vs. PQLs

Parameter (ug/L)	ROD Criteria	Water ingestion + Fish consumption	PQL (8010)	MDL (8010)
DCA	4050	-	0.7	0.07
DCE	7	0.06	1	0.13
MC	2.5	4.7	-	-
PCE	0.7	0.8	0.3	0.03
TCA	200	18,400	0.3	0.03
TCE	5	2.7	1	0.12

<sup>3</sup> The monthly average is defined as the average of the measured values obtained over a calendar month's time.

<sup>4</sup> The daily maximum is defined as the highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

<sup>5</sup> The daily maximum will be determined as a result of the removal efficiency of the system.

As highlighted in Table 3, the ROD criteria for DCE and TCE exceed the NTR values. Based on the following mass balance, downstream TCE concentrations will be below the NTR value for TCE (2.7 ug/L), therefore the ROD criteria is acceptable for an effluent limit.

$$C_d Q_d = (Q_u C_u + Q_e C_e), \text{ yields}$$

$$\begin{aligned} C_d &= (Q_u C_u + Q_e C_e) / Q_d \\ &= 0.07 \text{ ug/L, where} \end{aligned}$$

$$C_d = \text{Downstream TCE concentration}$$

$$\begin{aligned} C_u &= \text{Upstream TCE concentration} \\ &= 0 \text{ ug/L} \end{aligned}$$

$$\begin{aligned} C_e &= \text{Effluent TCE concentration} \\ &= 5 \text{ ug/L, ROD criteria} \end{aligned}$$

$$\begin{aligned} Q_d &= \text{Downstream flow} \\ &= Q_e + Q_u \end{aligned}$$

$$\begin{aligned} Q_u &= \text{Harmonic mean upstream flow (Dartford gauging station)} \\ &= 155 \text{ cfs} \end{aligned}$$

$$\begin{aligned} Q_e &= \text{Effluent flow} \\ &= 2.2 \text{ cfs} \end{aligned}$$

Based on the following mass balance, downstream DCE concentrations will exceed the NTR value for DCE (0.06 ug/L) if the effluent limit is set at the ROD criteria.

$$C_d Q_d = (Q_u C_u + Q_e C_e), \text{ yields}$$

$$\begin{aligned} C_d &= (Q_u C_u + Q_e C_e) / Q_d \\ &= 0.10 \text{ ug/L, where} \end{aligned}$$

$$C_d = \text{Downstream DCE concentration}$$

$$\begin{aligned} C_u &= \text{Upstream DCE concentration} \\ &= 0 \text{ ug/L} \end{aligned}$$

$$\begin{aligned} C_e &= \text{Effluent DCE concentration} \\ &= 7 \text{ ug/L, ROD criteria} \end{aligned}$$

$$\begin{aligned} Q_d &= \text{Downstream flow} \\ &= Q_e + Q_u \end{aligned}$$

$$\begin{aligned} Q_u &= \text{Harmonic mean upstream flow (Dartford gauging station)} \\ &= 155 \text{ cfs} \end{aligned}$$

$$\begin{aligned} Q_e &= \text{Effluent flow} \\ &= 2.2 \text{ cfs} \end{aligned}$$

So as to meet the NTR value at the edge of a mixing zone, the following mass balance establishes a revised effluent limit for DCE.

$$C_{mz}(Q_{mz} + Q_e) = C_u Q_{mz} + C_e Q_e, \text{ yields}$$

$$\begin{aligned} C_e &= (C_{mz}(Q_{mz} + Q_e) - C_u Q_{mz})/Q_e \\ &= 1.0 \text{ ug/L, where} \end{aligned}$$

$$\begin{aligned} C_{mz} &= \text{Maximum edge of mixing zone DCE concentration (NTR value)} \\ &= 0.06 \text{ ug/L} \end{aligned}$$

$$\begin{aligned} C_u &= \text{Upstream DCE concentration} \\ &= 0 \text{ ug/L} \end{aligned}$$

$$C_e = \text{Effluent DCE concentration}$$

$$\begin{aligned} Q_{mz} &= \text{Mixing zone flow} \\ &= (1/4) Q_u \end{aligned}$$

$$\begin{aligned} Q_u &= \text{Harmonic mean upstream flow (Dartford gauging station)} \\ &= 155 \text{ cfs} \end{aligned}$$

$$\begin{aligned} Q_e &= \text{Effluent flow} \\ &= 2.2 \text{ cfs} \end{aligned}$$

The effluent limit for chloride (230 mg/L) is based on the freshwater chronic value set forth in the State of Washington's Water Quality Standards for Surface Waters (chapter 173-201A WAC) and Federal Water Quality Criteria.

The effluent limits for iron and manganese (300 ug/L and 50 ug/L, respectively) are based on the Secondary MCLs set forth in the State of Washington's Drinking Water Regulations (chapter 246-290 WAC).

The effluent limit for nitrates (10 mg/L) is based on the MCL set forth in the State of Washington's Drinking Water Regulations (chapter 246-290 WAC) and the federal Safe Drinking Water Act.

The effluent limit for phosphorous (930 ug/L) is based on attaining the water quality criterion of 100 ug/L, recommended in EPA's Quality Criteria for Water 1986 (the Gold Book), at the edge of the mixing zone, as demonstrated in the following mass balance:

$$C_{mz}(Q_{mz} + Q_e) = C_u Q_{mz} + C_e Q_e, \text{ yields}$$

$$\begin{aligned} C_e &= (C_{mz}(Q_{mz} + Q_e) - C_u Q_{mz})/Q_e \\ &= 930 \text{ ug/L, where} \end{aligned}$$

$$\begin{aligned} C_{mz} &= \text{Maximum edge of mixing zone phosphorous concentration from the} \\ &\quad \text{Gold book} \end{aligned}$$

	=	100 ug/L
$C_u$	=	Upstream phosphorous concentration ("Water Quality Assessment for the Little Spokane River System")
	=	20 ug/L
$C_e$	=	Effluent phosphorous concentration
$Q_{mz}$	=	Mixing zone flow
	=	$(1/4) Q_u$
$Q_u$	=	Dartford 7Q10 upstream flow (Dartford gauging station)
	=	91.9 cfs
$Q_e$	=	Effluent flow
	=	2.2 cfs

### Whole Effluent Toxicity

The Water Quality Standards for Surface Waters require that the effluent not cause toxic effects in the receiving waters. Many toxic pollutants cannot be detected by commonly available detection methods. However, toxicity can be measured directly by exposing living organisms to the wastewater in laboratory tests and measuring the response of the organisms. Toxicity tests measure the aggregate toxicity of the whole effluent, and therefore this approach is called whole effluent toxicity (WET) testing. Some WET tests measure acute toxicity and other WET tests measure chronic toxicity.

Acute toxicity tests measure mortality as the significant response to the toxicity of the effluent. Dischargers who monitor their wastewater with acute toxicity tests are providing an indication of the potential lethal effect of the effluent to organisms in the receiving environment.

Chronic toxicity tests measure various sublethal toxic responses such as retarded growth or reduced reproduction. Chronic toxicity tests often involve either a complete life cycle test of an organism with an extremely short life cycle or a partial life cycle test on a critical stage of one of a test organism's life cycles. Organism survival is also measured in some chronic toxicity tests.

The WET tests evaluated during the previous substantive requirements indicate that no reasonable potential exists to cause receiving water acute toxicity. The substantive requirements will not include an acute WET limit but will require use of rapid screening tests to assure acute toxicity doesn't appear. If a rapid screening test indicates that acute toxicity has appeared, Spokane County will investigate immediately and take appropriate action. Toxicity is assumed to have increased if WET testing conducted in response to rapid screening tests fails to meet the performance standards in WAC 173-205-020 "whole effluent toxicity performance standard."

The WET tests evaluated during the previous substantive indicate that no reasonable potential exists to cause receiving water chronic toxicity. The substantive requirements will not include

a chronic WET limit but will require use of chronic rapid screening tests to assure chronic toxicity doesn't appear. If a rapid screening test indicates that chronic toxicity has appeared, Spokane County will investigate immediately and take appropriate action. Toxicity is assumed to have increased if WET testing conducted in response to rapid screening tests fails to meet the performance standards in WAC 173-205-020 "whole effluent toxicity performance standard."

#### Sediment Quality

Ecology has promulgated aquatic sediment standards (chapter 173-204 WAC) to protect aquatic biota and human health. These standards state that Ecology may require Permittees to evaluate the potential for the discharge to cause a violation of applicable standards (WAC 173-204-400).

Ecology has been unable to determine at this time the potential for this discharge to cause a violation of sediment quality standards. If Ecology determines in the future that there is a potential for violation of the Sediment Quality Standards, Ecology will discuss with Spokane County the need to demonstrate that either the point of discharge is not an area of deposition or, if the point of discharge is a depositional area, that there is not an accumulation of toxics in the sediments.

#### GROUND WATER QUALITY LIMITATIONS

Ecology has promulgated Ground Water Quality Standards (chapter 173-200 WAC) to protect beneficial uses of ground water. Permits issued by Ecology shall be conditioned in such a manner so as not to allow violations of those standards (WAC 173-200-100).

There is no discharge to ground and therefore no limitations are required based on potential effects to ground water.

#### COMPARISON OF EFFLUENT LIMITS WITH THE EXISTING SUBSTANTIVE REQUIREMENTS

The only limit that has been modified is for DCE. The previous limit (7 ug/L) was based on the ROD criteria. The new limit (1 ug/L) is based on meeting the NTR value at the edge of the mixing zone.

#### MONITORING AND REPORTING

Effluent monitoring, recording, and reporting are required (WAC 173-220-210 and 40 CFR 122.41) to verify that the treatment process is functioning correctly and the effluent limitations are being achieved.

The monitoring and testing schedule is detailed in the proposed substantive requirements under Condition S.2. Specified monitoring frequencies take into account the quantity and variability of the discharge, the treatment method, past compliance, significance of pollutants, and cost of monitoring.

## SUBSTANTIVE REQUIREMENTS

### S1. EFFLUENT LIMITATIONS

The discharge of treated groundwater at the designated outfall to the Little Spokane River is subject to meeting the following limitations:

#### OUTFALL No. 1 EFFLUENT LIMITATIONS

*Different from ROD*

Parameter	Monthly Average <sup>6</sup>	Daily Maximum <sup>7 8</sup>
Chloride	230 mg/L	
DCA		4050 ug/L
DCE		1 ug/L
Iron	300 ug/L	
Manganese	50 ug/L	
MC		2.5 - 25* ug/L
Nitrates	10 mg/L	
Total Phosphorus		930 ug/L
PCE		0.7 - 7* ug/L
TCA		200 ug/L
TCE		5 ug/L

*\*These figures are part of the evaluation and performance criteria in the Consent Decree.*

<sup>6</sup> The monthly average is defined as the average of the measured values obtained over a calendar month's time.

<sup>7</sup> The daily maximum is defined as the highest allowable daily discharge of a pollutant measured during a calendar day or any 24-hour period that reasonably represents the calendar day for purposes of sampling. The daily discharge is calculated as the average measurement of the pollutant over the day.

<sup>8</sup> The daily maximum will be determined as a result of the removal efficiency of the system.

## S2. TESTING SCHEDULE

Spokane County shall monitor the system and the treated groundwater according to the following schedule:

Tests	Sample Location	Sampling Frequency	Sample Type
Volatile Organic Compounds (Method 8010)	Combined influent pipeline and discharge pipeline at treatment facility designated location	Six Constituents of Concern - monthly; Full Method 8010 compounds - quarterly	Grab
Toxicity Testing - Rapid Screening Tests	Discharge pipeline at treatment facility designated location	Semi-annually	Grab <sup>9</sup>
Nitrate+Nitrite	Discharge pipeline at treatment facility designated location	Bi-monthly during Mid-May to Mid-September (=2 samples); Once during winter	Grab
Total Phosphorous	Discharge pipeline at treatment facility designated location	Monthly during Mid-May to Mid-September (= 3 samples); Once during winter	Grab
Chloride, Iron, Manganese	Discharge pipeline at treatment facility designated location	Quarterly	Grab
pH, Flow	Discharge pipeline at treatment facility designated location	Daily	Continuous - metered
Turbidity, Electrical Conductivity, Temperature	Discharge pipeline at treatment facility designated location	Weekly	Grab

Samples collected for the Rapid Screening tests should be collected concurrently with the samples collected for the VOC test.

## S3. MONITORING AND REPORTING

Spokane County shall monitor and report in accordance with the following conditions.

### A. Reporting

Monitoring results obtained during the previous three (3) months shall be summarized and reported in the Remedial Action Status Report and submitted no later than 3 months following the completed reporting period. The report shall be sent to the Department of Ecology, Toxics Cleanup Program, Site Cleanup Section, P.O. Box 47600, Olympia, Washington, 98504-7600.

<sup>9</sup> Sufficient quantity of effluent will be collected for archiving samples which may require chemical analysis, see Special Conditions S4. & S5.

B. Records Retention

Spokane County shall retain records of all monitoring information, including all calibration and maintenance records and all original recordings for continuous monitoring instrumentation, copies of all reports, and records of all data, for a period of at least 3 years.

C. Recording of Results

For each measurement or sample taken, Spokane County shall record the following information: (1) the date, exact place and time of sampling; (2) the individual who performed the sampling or measurement; (3) the dates the analyses were performed; (4) who performed the analyses; (5) the analytical techniques or methods used; and (6) the results of all analyses.

D. Representative Sampling

Samples and measurements taken to meet these requirements shall be representative of the volume and nature of the monitored discharge, including representative sampling of any unusual discharge or discharge condition, including bypasses, upsets and maintenance-related conditions affecting effluent quality.

E. Test Procedures

All sampling and analytical methods used to meet the monitoring requirements specified in these substantive requirements shall conform to the *Guidelines Establishing Test Procedures for the Analysis of Pollutants* contained in 40 CFR Part 136, unless otherwise specified or approved in writing by Ecology.

F. Flow Measurement

Appropriate flow measurement devices and methods consistent with accepted scientific practices shall be selected and used to ensure the accuracy and reliability of measurements of the volume of monitored discharges. The devices shall be installed, calibrated, and maintained to ensure that the accuracy of the measurements are consistent with the accepted industry standard for that type of device. Frequency of calibration shall be in conformance with manufacturer's recommendations or at a minimum frequency of at least one calibration per year. Calibration records should be maintained for a minimum of three years.

G. Laboratory Accreditation

All monitoring data, except for flow, temperature, settleable solids, conductivity, pH, and internal process control parameters, shall be prepared by a laboratory registered or accredited under the provisions of, Accreditation of Environmental Laboratories, Chapter 173-50 WAC. Conductivity and pH shall be accredited if the laboratory must otherwise be registered or accredited.

H. Additional Monitoring by Spokane County

If Spokane County monitors any pollutant more frequently than required by these substantive requirements (S2.) using test procedures specified by Condition S3.E., then the results of this monitoring shall be included in the calculation and reporting of the data submitted in the Quarterly Remedial Action Status Report.

S4. ACUTE TOXICITY

A. Testing Requirements

In consideration of the potential to have toxicity occur and cause receiving water impacts the following monitoring is required. Spokane County shall conduct 24 hour acute rapid screening tests using:

*Brachionus sp.* (ASTM E 1440-91)

OR

Fathead minnow, *Pimephales promelas* and a Daphnid (*Ceriodaphnia dubia*, *Daphnia pulex*, or *Daphnia magna*) on an alternating schedule (24-hour static test, method: EPA/600/4-90/027F).

A minimum of 40 organisms shall be used in both the control and 100% effluent. Tests shall be conducted once in the summer and once in the winter and have a maximum acceptable mortality rate of 0.20 in 100% effluent. The mortality rate is determined by WAC 173-205-120(2)(b). If the mortality rate is greater than 0.20, then the archived effluent samples will be analyzed for semi-volatile organics (8270), pesticides and PCBs (8080 and 8140), priority pollutant metals, and ammonia to determine the source of toxicity. The effluent may be retested with all species and durations used in the last substantive requirements with acute whole effluent toxicity testing - to be determined between Ecology and Spokane County.

B. Sampling and Reporting Requirements

1. All reports for whole effluent toxicity tests shall be submitted in accordance with the most recent Ecology specifications regarding format and content. Reports shall contain bench sheets and reference toxicant results for test methods.
2. Testing shall be conducted on grab samples. Samples taken for toxicity testing shall be cooled to 4 degrees Celsius while being collected and shall be sent to the lab immediately upon completion. The lab shall begin the toxicity testing as soon as possible but no later than 36 hours after sampling was ended.

3. All samples taken for toxicity testing shall have pH, total alkalinity, total hardness, dissolved oxygen, and conductivity or salinity measured prior to test initiation.
4. If test results are determined to be invalid or anomalous by Ecology, testing shall be repeated with freshly collected effluent. If control performance does not meet protocol standards for acceptability, the test shall be repeated with freshly collected effluent.
5. Dilution water for toxicity testing shall be laboratory water or pristine natural water of sufficient quality for good control performance.
6. The whole effluent toxicity tests shall be run on an unmodified sample of final effluent.
7. Spokane County may choose to conduct a full dilution series test in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control.
8. All whole effluent toxicity tests that involve hypothesis testing and do not comply with the acute statistical power standard of 29% as defined in WAC 173-205-020 must be repeated on a fresh sample with an increased number of replicates to increase the power.
9. Acids and bases shall not be added to samples or test solutions unless pH is outside of the range 6.0 to 9.0. Control of unionized ammonia toxicity due to pH rise shall only be accomplished by holding test chambers in a CO<sub>2</sub> atmosphere.

## S5. CHRONIC TOXICITY

### A. Testing Requirements

Spokane County shall conduct chronic rapid screening tests using:

Bacterial bioluminescence test. (Microtox® or approved alternate)

OR

Rotifer life cycle test. (Snell, Terry W. 1992. A 2-d Life Cycle Test With The Rotifer *Brachionus calyciflorus*. *Environ. Toxicol. Chem.* 11:1249-1257).

Tests shall be conducted once in the summer and once in the winter and shall be expected to have no statistically significant difference in response between the acute critical effluent concentration (ACEC) and the control using the method in Appendix H of EPA/600/4-89/001 or an equivalent method approved by Ecology. Whenever a rapid screening test result has a statistically significant difference in response between the ACEC and the control, then the archived effluent samples will be analyzed for semi-volatile organics (8270), pesticides and PCBs (8080 and 8140), priority pollutant metals, and ammonia to determine the source of toxicity. The effluent may be retested with all species and durations used in the last substantive requirements with acute whole effluent toxicity testing - to be determined between Ecology and Spokane County.

**B. Sampling and Reporting Requirements**

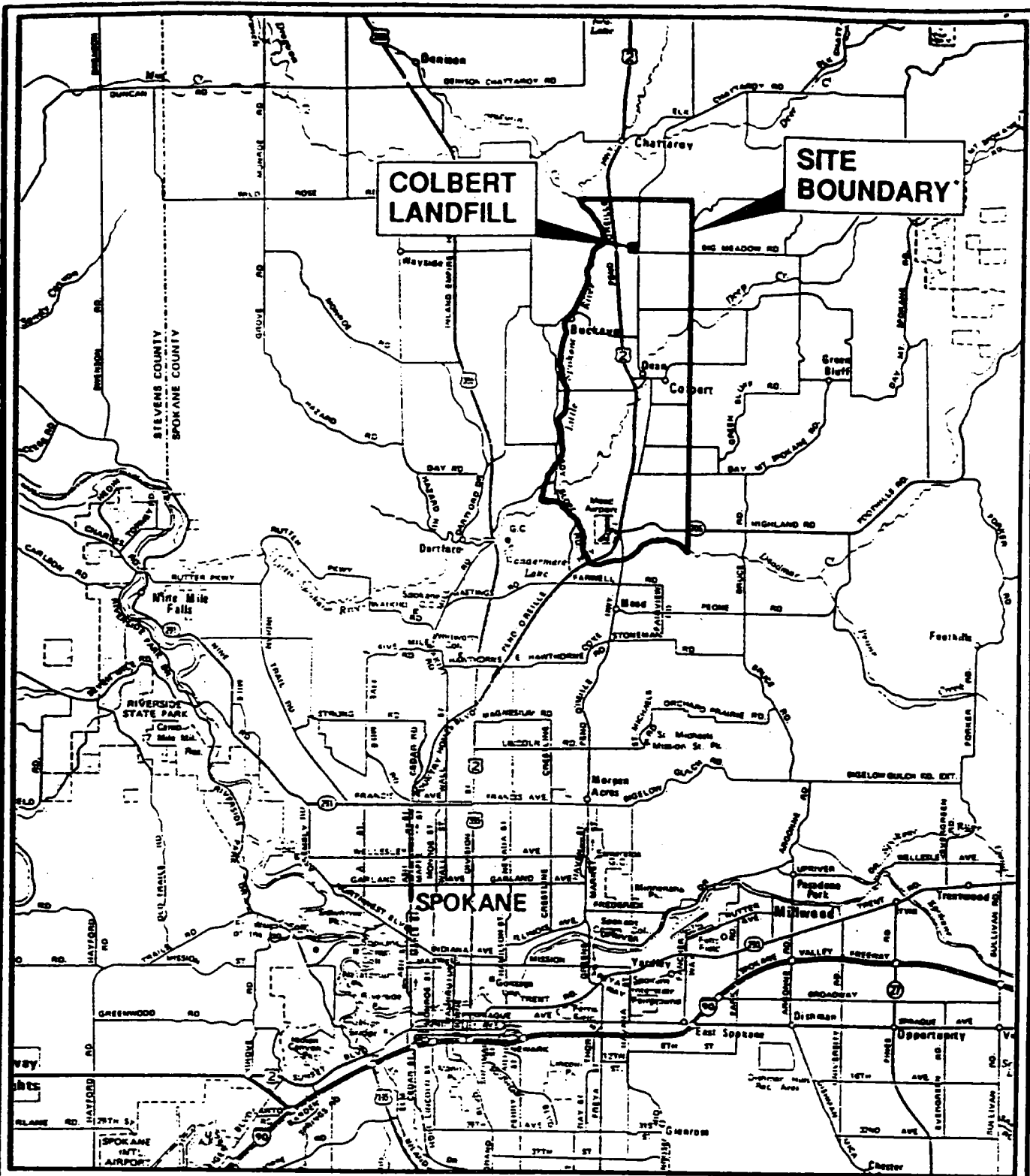
1. All reports for whole effluent toxicity tests shall be submitted in accordance with the most recent Ecology specifications regarding format and content. Reports shall contain bench sheets and reference toxicant results for test methods.
2. Testing shall be conducted on grab samples. Samples taken for toxicity testing shall be cooled to 4 degrees Celsius while being collected and shall be sent to the lab immediately upon completion. The lab shall begin the toxicity testing as soon as possible but no later than 36 hours after sampling was ended.
3. All samples taken for toxicity testing shall have pH, total alkalinity, total hardness, dissolved oxygen, and conductivity or salinity measured prior to test initiation.
4. If test results are determined to be invalid or anomalous by Ecology, testing shall be repeated with freshly collected effluent. If control performance does not meet protocol standards for acceptability, the test shall be repeated with freshly collected effluent.
5. Dilution water for toxicity testing shall be laboratory water or pristine natural water of sufficient quality for good control performance.
6. The whole effluent toxicity tests shall be run on an unmodified sample of final effluent.
7. Spokane County may choose to conduct a full dilution series test in order to determine dose response. In this case, the series must have a minimum of five effluent concentrations and a control.

8. All whole effluent toxicity tests that involve hypothesis testing and do not comply with the acute statistical power standard of 29% as defined in WAC 173-205-020 must be repeated on a fresh sample with an increased number of replicates to increase the power.
9. Acids and bases shall not be added to samples or test solutions unless pH is outside of the range 6.0 to 9.0. Control of unionized ammonia toxicity due to pH rise shall only be accomplished by holding test chambers in a CO<sub>2</sub> atmosphere.

#### S6. ALGAL GROWTH POTENTIAL STUDY

Algal Growth Potential Studies conducted under the previous substantive requirements shall resume between May and October if there is a significant increase in the nitrogen or phosphorus concentrations in the treated groundwater. A significant increase for nitrogen and phosphorous are defined as: a nitrogen concentration exceeding 7 mg/L for two consecutive sampling events; a phosphorous concentration exceeding 0.1 mg/L for two consecutive sampling events. Spokane County may cease algal growth studies between October and May; and/or when the nitrogen and phosphorous concentrations in the treated groundwater are less than 5 mg/L and 0.05 mg/L, respectively, and the algal growth studies indicate no significant difference between upstream and downstream algal growth potential.

When an algal growth potential study is triggered, Spokane County shall collect water samples from the Little Spokane River on a monthly basis from May to October and perform an algal growth potential study using the algae *Selenastrum capricornutum*. Water for the algal growth potential studies shall be collected upstream of the outfall of the treated groundwater and at a downstream location equivalent to the edge of the mixing zone. If no significant stimulation of algal growth potential is observed, then the algal growth potential studies shall be suspended.



\* As specified in the ROD (EPA 1987)



Regional Location Map

Figure 1-1

